



REMARKS

Applicants' note with appreciation the Examiner's indication of allowable subject matter, namely the subject matter recited in Claims 12, 13, and 14. Now in the application are Claims 1-16 of which Claim 1 is independent. Claims 17-31 have been withdrawn from consideration as a result of Applicants' election on July 9, 2003, without prejudice to Applicants' filing one or more divisional applications. The following comments address all stated grounds for rejection, and place the presently pending claims, as identified above, in condition for allowance. No new matter has been added and no new issues are raised. Thus, no further search is required. Accordingly, we understand that any further rejection of any of Claims 1-16 based on new art is to be non-final.

Claim Objections

Claim 12 stands objected to for lack of formality. Specifically, the Examiner contends the term "counter register" in line 10 of Claim 12 lacks antecedent basis. Applicants in the previous amendment amend Claim 12 to correct the identified informality. Specifically, Applicants replaced definite article "said" before counter with indefinite article "a" to correct the antecedent basis for the term "counter register". Applicants' respectfully request the Examiner to reconsider and withdraw the objection to Claim 12 for lack of formality.

Claim Rejections under 35 U.S.C. § 102

Claims 1, 2, 9-11, 15, and 16 stand rejected under 35 U.S.C. § 102. For ease of the discussion below each rejection under 35 U.S.C. § 102 is discussed separately.

A. Rejection of Claims 1, 2, 9-11, 15 and 16 under 35 U.S.C. § 102(b):

Claims 1, 2, 9-11, 15 and 16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 4,658,407 of Iwama (hereinafter "Iwama"). Applicants' respectfully traverse this rejection and contend that Iwama does not anticipate Claims 1, 2, 9-11, 15 and 16.

Claims 2, 9-11, 15 and 16 depend directly or indirectly upon Claim 1 and therefore incorporate the novel features of Claim 1.

Claim 1 is directed to a thermal sensor to sense a temperature. The thermal sensor of Claim 1 includes an oscillator circuit and one or more counter circuits. The oscillator circuit

generates a first oscillating signal and a second oscillating signal. The one or more counter circuits perform a first count on the first oscillating signal and a second count on the second oscillating signal. The one or more counter circuits halt the second count when the first count reaches a predetermined value and upon the first count reaching the predetermined value the counter circuit asserts a value of the second count to indicate a response of the thermal sensor.

The Iwama reference does not anticipate the subject matter of Claims 1, 2, 9-11, 15 and 16. The Iwama reference is directed to an electronic clinical thermometer having a power shut off feature for discontinuing a temperature measurement at a prescribed time after the beginning of the temperature detection or upon detection of a measurement value. The electronic clinical thermometer of Iwama includes a thermometric oscillator circuit whose oscillation frequency varies in response to temperature and a reference oscillator circuit for outputting a reference clock.

Iwama also includes a thermometric counter that counts for a time "t" the oscillations which are linear relative to the temperature from the thermometric oscillator, and a clock counter to count the oscillations of the reference oscillator. The clock counter counts the oscillations of the reference oscillator until the clock counter is reset or an overflow condition occurs in the clock counter. The Iwama reference does not disclose a thermal sensor having an oscillator circuit to generate a first oscillating signal and a second oscillating signal. Nor does the Iwama reference disclose a thermal sensor having one or more counter circuits to perform a first count on a first oscillating signal and a second count on a second oscillating signal, wherein the counter circuit halts the second count when the first count reaches a predetermined value and upon the first count reaching the predetermined value the counter circuit asserts a value of the second count to indicate a response of the thermal sensor.

In contrast to the Iwama reference, Claim 1 recites a thermal sensor to sense a temperature that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal, and one or more counter circuits. The one or more counter circuits perform a first count on the first oscillating signal and a second count on the second oscillating signal. The one or more counter circuits halt the second count when the first count reaches a predetermined value and upon the first count reaching the predetermined value the counter circuit asserts a value of the second count to indicate a response of the thermal sensor. Nowhere does Iwama disclose such features. The Iwama reference discloses two separate and distinct oscillator

circuits, each disclosed oscillator circuit generates one oscillating signal. Moreover the reference counter of Iwama is a timer, much like a watchdog timer used to determine when a temperature measurement times out.

In the Office Action, it is admitted by the Examiner that Iwama does not expressly disclose a thermal sensor that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal. Nonetheless, the Examiner argues that Iwama inherently has an electrical circuit and that electrical circuit includes the reference oscillating circuit and the thermometric oscillating circuit. It is further implied in the Office Action that this inherent electrical circuit could be called an oscillator circuit. Applicants' respectfully disagree with the Examiner's assertions that Iwama inherently discloses a thermal sensor to sense a temperature having an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

It is well recognized that anticipation for inherency requires certainty of inherency, not just a mere possibility. As the Federal Circuit Court of Appeals emphasized in *Trintec Industries Inc. v. Top-U.S.A. Corp.* 63 uspq2D 1597, 1599 (Fed. Cir. 2002): "*A single prior art reference anticipates a patent claim if it expressly or inherently describes each and every limitation set forth in the patent claim.* *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). *Inherent anticipation requires that the missing descriptive material is "necessarily present," not merely probably or possibly present in the prior art.* *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999) (citing *Continental Can Co. USA, Inc. v. Monsanto Co.*, 948 F.2d 1264, 1268, 20 USPQ2d 1746, 1749 (Fed. Cir. 1991)).". Nowhere in the Iwama reference is there disclosed the fact that an oscillator circuit to generate a first oscillating signal and a second oscillating signal. In fact, the disclosure of Iwama provides evidence that combining the thermometric oscillator and the reference oscillator is undesirable. Hence, an oscillator circuit to generate a first oscillating signal and a second oscillating signal is not present in the Iwama reference.

The Iwama discloses a thermometric oscillator constructed from a temperature sensitive resistor, amongst other components. As such, the temperature sensitive resistor is likely isolated from other circuitry to avoid heat dissipated by other circuits and circuit components. The need to isolate the temperature sensitive resistor avoids temperature measurement inaccuracies due to the heat dissipated by other circuit components in proximity thereto. Temperature measurement inaccuracies are unacceptable for the clinical thermometer of Iwama. Clinical thermometers like

the one disclosed in Iwama are used within environments that often include hospitals, doctor offices, clinics, schools, and other environments where a patient's temperature is likely to be taken. Therefore, in order to provide an accurate temperature reading of a patient, it is inherent in Iwama to teach two separate and distinct oscillator circuits. Hence, the missing descriptive material of one circuit to generate a first oscillating signal and a second oscillating signal is not inherently present in Iwama. Accordingly, the rationale to show inherency in the Iwama reference of an oscillator circuit to generate a first oscillating signal and a second oscillating signal lacks any basis in fact or technical reasoning to reasonably support an implication that the Iwama reference discloses the inherent characteristic of one oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Furthermore, nowhere does the Iwama reference disclose one or more counter circuits to perform a first count on the first oscillating signal and a second count on the second oscillating signal and the counter circuit halts the second count when the first count reaches a predetermined value and upon the first count reaching the predetermined value the counter asserts a value of the second count to indicate a response of the thermal sensor. Iwama discloses a thermometric counter that counts for a time "t" the oscillations which are linear relative to the temperature from the thermometric oscillator. Iwama also discloses a clock counter for counting the oscillations of the reference oscillator and for outputting an overflow signal to discontinue the oscillation of the thermal metric oscillator after a prescribed time. That is, if the clock counter is not reset it continues to count until an overflow takes place after a prescribed period of time. When an overflow takes place, the temperature measurement being performed has timed out and thereafter the oscillation of the thermometric oscillator is halted. If no overflow occurs in the clock counter a temperature value is displayed and the thermometric counter is preset.

Iwama does not disclose a counter circuit that halts a second count when a first count reaches a predetermined value and upon the first count reaching the predetermined value the counter circuit asserts a value of the second count to indicate a response of the thermal sensor. Iwama discloses a clock counter that upon reaching an overflow condition (i.e., the counter times out) it halts the thermometric oscillator to halt the temperature measurement. When an overflow condition occurs a value held by the thermometric counter is not asserted to indicate a response of the thermometer.

For at least these reasons, the Iwama reference does not disclose a thermal sensor to sense a temperature having an oscillator circuit to generate a first oscillating signal and a second oscillating signal. Accordingly, the Iwama reference fails to anticipate Claims 1, 2, 9-11, 15 and 16. Hence, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claims 1, 2, 9-11, 15 and 16 under 35 U.S.C. § 102(b).

B. Rejection of Claims 1, 2, 9, 15 and 16 under 35 U.S.C. § 102(b):

Claims 1, 2, 9, 15 and 16 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5, 626,425 of Fujikawa, et al. (hereinafter "Fujikawa"). Applicants' respectfully traverse this rejection and contend that Fujikawa does not anticipate Claims 1, 2, 9, 15 and 16.

Claims 2, 9, 15 and 16 depend directly or indirectly, upon Claim 1 and thereby incorporate the novel features of Claim 1.

The Fujikawa reference is directed to an electronic thermometer with an audible temperature rise indicator. The electronic thermometer of Fujikawa includes a reference oscillator circuit which generates a reference signal and a thermosensitive oscillator circuit which generates a thermal sensitive signal whose frequency depends on a change in its temperature. Nowhere does the Fujikawa reference disclose a thermal sensor to sense a temperature having an oscillator circuit to generate a first oscillating signal and a second oscillating signal. Fujikawa discloses two oscillator circuits and each generate a single oscillating signal. In contrast, the thermal sensor of Claim 1 includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Column 2, lines 8-67, of Fujikawa discuss the operation of two oscillator circuits. Those two distinct circuits are reference oscillator (1) and thermosensitive oscillator (3). The two distinct oscillator circuits are illustrated in Figure 2 of Fujikawa as two distinct circuits. Applicants note that Figure 2 includes a dashed box around comparator (8), data hold (7), temperature rise detection device (21) and temperature counter (6) to illustrate a circuit entitled "maximum temperature information hold device"(20). Nowhere does Fujikawa disclose an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Furthermore, Fujikawa does not disclose a temperature sensor having one or more counter circuits to perform a first count on the first oscillating signal and a second count on the

second oscillating signal and the counter circuit halts the second count when the first count reaches a predetermined value and upon the first count reaching the predetermined value the counter asserts a value of the second count to indicate a response of the thermal sensor. Fujikawa discloses one counter circuit, that is temperature counter (6).

Hence, the Fujikawa reference does not anticipate Claims 1, 2, 9, 15, and 16.

For at least these reasons, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claims 1, 2, 9, 15 and 16 under 35 U.S.C. § 102(b).

Claim Rejections under 35 U.S.C. § 103

Claims 3, 4, 5, 6, 7 and 8 stand rejected under 35 U.S.C. § 103. For ease of the discussion below, each claim rejection under 35 U.S.C. § 103 is discussed separately.

A. Rejection of Claims 3 and 4 under 35 U.S.C. § 103(a):

Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwama in view of U.S. Patent No. 5,832,048 of Woodman, Jr. (hereinafter "Woodman"). Applicants' respectfully traverse this rejection and contend that Iwama in view of Woodman does not detract from the patentability of Claims 3 and 4.

Claims 3 and 4 depend, directly or indirectly, upon Claim 1 and therefore incorporate the novel features of Claim 1.

The Woodman reference is cited for teaching or suggesting a voltage regulator made up of an analog to digital converter, an arithmetic Fast Fourier Transform circuit and a digital to analog converter. The Woodman reference is further cited for teaching or suggesting a voltage controlled oscillator generating an oscillating signal based on a reference oscillator.

The Woodman reference fails to bridge the factual deficiencies of the Iwama reference. The Woodman reference is concerned with a digital phase lock loop control system and is not concerned with a thermal sensor to sense a temperature. Nowhere in the Woodman reference is there a teaching or suggestion of a thermal sensor to sense a temperature having an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Accordingly, Applicants' contend that the Iwama reference in view of the Woodman reference fails to teach and suggest each and every feature of Claims 3 and 4. Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claims 3 and 4 under 35 U.S.C. § 103(a).

B. Rejection of Claims 3 and 4 under 35 U.S.C. § 103(a):

Claims 3 and 4 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the Iwama reference in view of U.S. Patent No. 6,362,699 of Fry (hereinafter "Fry"). Applicants' respectfully traverse this rejection and contend that Iwama in view of Fry does not detract from the patentability of Claims 3 and 4.

Claims 3 and 4 depend, directly or indirectly, upon Claim 1 and therefore incorporate the novel features of Claim 1.

The Fry reference teaches or suggests a temperature compensating circuit for a crystal oscillator. Fry is concerned with a compensating circuit for a crystal oscillator that stabilizes the output frequency of the crystal oscillator over a desired temperature range. Fry is not concerned with a thermal sensor to sense a temperature.

The Fry reference fails to bridge the factual deficiencies of the Iwama reference. Nowhere in the Fry reference is there a teaching or suggestion of a thermal sensor to sense a temperature that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Accordingly, Applicants' contend that the Iwama reference in view of the Fry reference fails to teach and suggest each and every feature of Claims 3 and 4. Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claims 3 and 4 under 35 U.S.C. § 103(a).

C. Rejection of Claim5 under 35 U.S.C. § 103(a):

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the Iwama reference in view of U.S. Patent No. 5,193,387 of Hodate (hereinafter "Hodate"). Applicants'

respectfully traverse this rejection and contend that the Iwama reference in view of the Hodate reference fails to detract from the patentability of Claim 5.

Claim 5 depends, directly or indirectly, upon Claim 1 and thereby incorporates the novel features of Claim 1.

The Hodate reference is directed to a tire interior monitoring apparatus. The Hodate reference is cited for teaching or suggesting a voltage controlled oscillator that outputs a signal of a frequency proportional to a voltage supplied from a temperature transducer. Nowhere in the Hodate reference is there a teaching or suggestion of a thermal sensor to sense a temperature having an oscillator circuit to generate a first oscillating signal and a second oscillating signal. As such, Applicants' contend that the Iwama reference in view of the Hodate reference fails to teach and suggest each and every feature of Claim 1.

Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claim 5 under 35 U.S.C. § 103(a).

D. Rejection of Claim 6 under 35 U.S.C. § 103(a):

Claim 6 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwama in view of Hodate and further in view of U.S. Patent No. 5,892,408 of Binder (hereinafter "Binder"). Applicants' respectfully traverse this rejection and contend that Iwama in view of Hodate and further in view of Binder fails to detract from the patentability of Claim 6.

Claim 6 depends, directly or indirectly, upon Claim 1 and therefore incorporates the novel features of Claim 1.

The Binder reference teaches or suggests a method and system for calibrating a crystal oscillator. The Binder reference is cited for teaching or suggesting a voltage regulator to regulate an output value of a temperature dependent voltage source. The Binder reference fails to bridge the factual deficiencies of the Iwama reference and the Hodate reference. Nowhere in the Binder reference is there a teaching or suggestion of a thermal sensor to sense a temperature that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal. Accordingly, Applicants' contend that the Iwama reference in view of the Hodate reference and further in view of the Binder reference fails to teach or suggest each and every feature of Claim

6. Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claim 6 under 35 U.S.C. § 103(a).

E. Rejection of Claim 8 under 35 U.S.C. § 103(a):

Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwama in view of Hodate and further in view of U.S. Patent No. 5,838,578 of Pippin (hereinafter "Pippin"). Applicants' respectfully traverse this rejection and contend that the Iwama reference in view of the Hodate reference and further in view of the Pippin reference fails to detract from the patentability of Claim 8.

Claim 8 depends, directly or indirectly, upon Claim 1 and thereby incorporates the novel features of Claim 1.

The Pippin reference teaches or suggests a programmable thermal sensor for an integrated circuit. The Pippin reference is cited for teaching or suggesting a silicon band gap reference circuit.

The Pippin reference fails to bridge the factual deficiencies of the Iwama reference and the Hodate reference. Nowhere in the Pippin reference is there a teaching or suggestion of a thermal sensor to sense a temperature that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Accordingly, Applicants' contend that the Iwama reference in view of the Hodate reference and in further view of the Pippin reference fails to teach or suggest each and every feature of Claim 8. Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claim 8 under 35 U.S.C. § 103(a).

F. Rejection of Claim 7 under 35 U.S.C. § 103(a):

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over the Iwama reference in view of the Fry reference and further in view of U.S. Patent No. 5,097,198 of Holmdahl (hereinafter "Holmdahl"). Applicants' respectfully traverse this rejection and contend that the Iwama reference in view of the Fry reference and further in view of the Holmdahl reference fails to detract from the patentability of Claim 7.

Claim 7 depends, directly or indirectly, upon Claim 1 and thereby incorporates the novel features of Claim 1.

The Holmdahl reference teaches or suggests a variable power supply with a predetermined temperature coefficient. The Holmdahl reference is cited for teaching or suggesting a temperature independent voltage source in a thermal sensor that comprises a band gap reference circuit.

The Holmdahl reference fails to bridge the factual deficiencies of the Iwama reference and the Fry reference. Nowhere in the Holmdahl reference is there a teaching or suggestion of a thermal sensor to sense a temperature that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

Accordingly, Applicants' contend that the Iwama reference in view of the Fry reference and further in view of the Holmdahl reference fails to teach or suggest each and every feature of Claim 7. Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claim 7 under 35 U.S.C. § 103(a).

G. Rejection of Claim 7 under 35 U.S.C. § 103(a):

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwama in view of Fry and further in view of U.S. Patent No. 4,165,642 of Lipp (hereinafter "Lipp"). Applicants' respectfully traverse this rejection and contend that the Iwama reference in view of the Fry reference and in further view of the Lipp reference fails to detract from the patentability of Claim 7.

Claim 7 depends, directly or indirectly, upon Claim 1 and thereby incorporates the novel features of Claim 1.

The Lipp reference teaches or suggests a circuit for comparison of a temperature dependent junction voltage and a band gap reference voltage. The output of the comparison is converted to a binary coded decimal output signal to provide a temperature measurement. The Lipp reference is cited for teaching or suggesting a temperature independent voltage source comprising a band gap voltage reference circuit.

The Lipp reference fails to bridge the factual deficiencies of the Iwama reference and the Fry reference. Nowhere in the Lipp reference is there a teaching or suggestion of a thermal sensor to sense a temperature that includes an oscillator circuit to generate a first oscillating signal and a second oscillating signal.

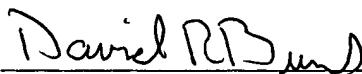
Accordingly, Applicants' contend that the Iwama reference in view of the Fry reference and in further view of the Lipp reference fails to teach or suggest each and every feature of Claim 7. Accordingly, Applicants' respectfully request the Examiner to reconsider and withdraw the rejection of Claim 7 under 35 U.S.C. § 103(a).

CONCLUSION

In view of the remarks set forth above, Applicants contend that Claims 1-16 presently pending in this application, are patentable, and in condition for allowance. If the Examiner deems there are any remaining issues, we invite the Examiner to call the undersigned at (617) 227-7400.

Respectfully submitted,

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